Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for training ~~a system to inspect a~~ spatially distorted pattern, the method comprising:

receiving a digitized image of an object, the digitized image including a region of interest;

dividing the region of interest in its entirety into a plurality of sub-regions, a size of each of the sub-regions being small enough such that a conventional inspecting method can reliably inspect each of the sub-regions;

training a search tool and an inspection tool for a respective single model for each of the plurality of sub-regions;

building a single search tree for determining an order for inspecting each sub-region of the plurality of sub-regions at a run-time; and

training a coarse alignment tool for the region of interest in its entirety.

~~Claim 2 (original): The method according to claim 1, wherein the size of each of~~ the sub-regions is small enough such that each of the sub-regions is well approximated by an affine transformation.

Claim 3 (original): The method of claim 1, wherein the building of the search tree comprises:

establishing the order so that transformation information for located ones of the sub-regions is used to minimize a search range for neighboring ones of the sub-regions.

Claim 4 (currently amended): The method of claim 1, wherein the training of the search tool for the respective single model for each of the plurality of sub-regions is performed by using a correlation search.

Claim 5 (currently amended): The method of claim 1, wherein the training of the inspection tool for the respective single model for each of the plurality of sub-regions is performed by using a golden template comparison method.

Claim 6 ~~(currently amended): A method for inspecting a spatially distorted~~ pattern, the method comprising:

running a coarse alignment tool to approximately locate the pattern within a region of interest;

using search tree information of a single search tree and an approximate location of a root sub-region, found by the coarse alignment tool, to locate, sequentially in an order according to the search tree information, a plurality of sub-regions within the region of interest, the sub-regions covering the region of interest in its entirety, ~~sequentially in an order according to the search tree information~~ each of the sub-regions being of a size small enough such that a conventional inspecting method can reliably inspect each of the sub-regions using respective single models;

inspecting each of the sub-regions so as to produce a difference image for each of the sub-regions.

Claim 7 (original): The method of claim 6, further comprising:

combining all location information to produce a distortion vector field for each of the sub-regions; and

using the distortion vector fields to make a pass/fail decision based on user-specified tolerances.

~~Claim 8 (previously presented): The method of claim 6, wherein:~~

the inspecting produces a match image for each of the sub-regions, the method further comprising:

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combining the difference images for each of the sub-regions into a single difference image; and

combining the match images for each of the sub-regions into a single match image.

Claim 9 (original): The method of claim 7, wherein:

the inspecting produces a difference image for each of the sub-regions and a match image for each of the sub-regions, the method further comprising:

combining the difference images for each of the sub-regions into a single difference image;

combining the match images for each of the sub-regions into a single match image; and

combining all locations information to produce a distortion vector field for ~~each of the~~ sub-regions.

~~Claim 10 (original): The method according to claim 6,~~ wherein the size of each of the sub-regions is small enough such that each of the sub-regions is well approximated by an affine transformation.

Claim 11 (original): The method of claim 6, further comprising:

using transformation information from located ones of the sub-regions to interpolate transformation information for a sub-region when the sub-region cannot be located; and

inspecting the sub-region based on the interpolated transformation information.

Claim 12 (currently amended): The method of claim 6, further comprising:

using the respective models for at least some of the sub-regions to determine respective transformation information; and

predicting registration results in at least one of the sub-regions by using the respective transformation information of neighboring ones of the at least some of ~~the sub-regions when~~ training of the search tool for the respective <u>single</u> model for the at least one of the sub-regions was not successfully performed.

~~Claim 13 (original): The method of claim 6, wherein the inspecting of each of the~~ sub-regions is performed by a golden-template comparison method.

Claim 14 (currently amended): An apparatus for inspecting a spatially distorted pattern, the apparatus comprising:

a memory for storing a digitized image of an object;

a region divider for dividing the digitized image of a region of interest in its entirety into a plurality of sub-regions, the sub-regions covering the region of interest completely, a size of each of the sub-regions being small enough such that a conventional inspecting method can reliably inspect each of the sub-regions;

a coarse alignment mechanism for approximately locating the pattern;

a search mechanism for locating each of the sub-regions sequentially in an order based on a single search tree; and

an inspector for inspecting each of the sub-regions.

Claim 15 (original): The apparatus of claim 14, further comprising:

a vector field producer to combine all location information to produce a distortion vector field for each of the sub-regions; and

a comparing mechanism for using the distortion vector field to make a pass/fail decision based on user specified tolerances.

~~Claim 16~~ ~~(original):~~ The apparatus of claim 14, wherein:

the inspector for inspecting each of the sub-regions produces a difference image for each of the sub-regions and a match image for each of the sub-regions, the apparatus further comprises:

a first combiner for combining the difference images for each of the sub-regions into a single difference image; and

a second combiner for combining the match images for each of the sub-regions into a single match image.

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Claim 17 (original): The apparatus according to claim 14, wherein the size of each of the sub-regions is small enough such that each of the sub-regions is well approximated by an affine transformation.

Claim 18 (original): The apparatus of claim 14, further comprising:

an interpolation for using transformation information from located ones of the sub-regions to interpolate transformation information for a sub-region when the sub-region cannot be located by the search mechanism; wherein

the inspector inspects the sub-region based on the interpolated transformation information.

Claim 19 (currently amended): The apparatus of claim 14, further comprising:

an ~~interpolator for using~~ the respective models for at least some of the sub-regions to determine respective transformation information, ~~and for~~

~~predicting registration results in at least one of the sub-regions by using the~~ respective transformation information of neighboring ones of the ~~at least~~ some of the sub-regions when training of the respective single model for the at least one of the sub-regions was not successfully performed.

Claim 20 (original): The apparatus of claim 14, wherein the inspector inspects each of the sub-regions by using a golden-template comparison method.

Claim 21 (currently amended): An apparatus for inspecting a spatially distorted pattern, the apparatus comprising:

a storage for storing a digitized image of an object, the digitized image including a region of interest;

a region divider for dividing the region of interest in its entirety into a plurality of sub-regions, a size of each of the sub-regions being small enough such that a conventional inspecting method can reliably inspect each of the sub-regions;

a trainer for training a respective single model for a search tool and for an inspection tool for each of the plurality of sub-regions;

a search tree builder for building a single search tree for determining an order for inspecting each sub-region of the plurality of sub-regions at a run time;

a course ~~alignment trainer~~;

~~a course alignment mechanism for approximately locating the pattern, the~~ coarse alignment mechanism being configured to be trained by the coarse alignment trainer;

a search mechanism for locating each of the sub-regions sequentially in an order based on the search tree, a root sub-region being provided by the coarse alignment mechanism; and

an inspector for inspecting each of the sub-regions.

Claim 22 (original): The apparatus according to claim 21, further comprising:

a vector field producer to combine all location information to produce a distortion vector field for each of the sub-regions; and

a comparing mechanism for using the distortion vector fields to make a pass/fail decision based on user specified tolerances.

Claim 23 (original): The apparatus of claim 21, wherein:

the inspector produces a difference image for each of the sub-regions and a match image for each of the sub-regions, the apparatus further comprises:

a first combiner for combining the differences images for each of the sub-regions into a single difference image; and

a second combiner for combining the match images for each of the sub-regions into a single match image.

Claim 24 (original): The apparatus according to claim 21, wherein the size of each of the sub-regions is small enough such that each of the sub-regions is well approximated by an affine transformation.

Claim 25 (original): The method of claim 21, wherein the building of the search tree comprises:

establishing the order so that transformation information for located ones of the sub-regions is used to minimize a search range for neighboring ones of the sub-regions.

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Claim 26 (original): The apparatus of claim 21, further comprising:

an interpolator for using transformation information from located ones of the sub-regions to interpolate transformation information for a sub-region when the sub-region cannot be located, wherein

the inspector inspects the previously unlocated sub-region based on the interpolated transformation information.

Claim 27 (currently amended): A medium having a stored therein machine-readable information, such that when the machine-readable information is read into a memory of a computer and executed, the machine-readable information causes the computer:

to receive a digitized image of an object, the digitized image including a region of interest;

to divide the region of interest in its ~~entirety into a plurality of sub-regions,~~ a size of each of the sub-regions being small enough such that a conventional inspecting method can reliably inspect each of the sub-regions;

to train a respective single model for a search tool and for an inspection tool for each of the plurality of sub-regions;

to build a single search tree for determining an order for inspecting the plurality of sub-regions at a run-time; and

to train a respective model for a coarse alignment tool.

Claim 28 (original): The medium of claim 27, wherein when building the search tree, the machine-readable information causes the computer:

to establish the order so that transformation information for located ones of the sub-regions is used to minimize a search range for neighboring ones of the sub-regions.

Claim 29 (original): The medium of claim 27, wherein the machine-readable information further causes the computer:

to run a coarse alignment tool to approximately locate a pattern;

to use information from a search tree and a root sub-region approximately located by the coarse alignment to locate a plurality of sub-regions sequentially in an order according to the information from the search tree, each of the sub-regions being of a size small enough such that a conventional inspecting method can reliably inspect each of the sub-regions; and

to inspect ~~each of the sub-regions to produce~~ a difference image for each of the sub-regions and a match image for each of the sub-regions.

Claim 30 (original): The medium of claim 29, wherein the machine-readable information further causes the computer:

to combine the difference images for each of the sub-regions into a single difference image; and

to combine the match images for each of the sub-regions into a single match image.

Claim 31 (original): The medium of claim 29, wherein the machine-readable information further causes the computer:

to combine all location information to produce a distortion vector field for each of the sub-regions; and

to use the distortion vector fields to make a pass/fail decision based on user-specified tolerances.

Claim 32 (original): The medium of claim 27, wherein the machine-readable information further causes the computer:

to use transformation information from located ones of the sub-regions to interpolate transformation information for a sub-region when the sub-region cannot be located~~; and~~

~~to run a~~ search tool on the sub-region based on the interpolated transformation information.

Claim 33 (previously presented): The method of claim 6, further comprising:

dividing one of the sub-regions into a plurality of smaller sub-regions when the one of the sub-regions cannot be located using a search tool.

Claim 34 (original): A method for inspecting a spatially distorted pattern, the method comprising:

running a coarse alignment tool to approximately locate the pattern:

using search tree information and an approximate location of a root sub-region, found by the coarse alignment tool, to locate a plurality of sub-regions sequentially in an order according to the search tree information, each of the sub-regions being of a size small enough such that a convention inspecting method can reliably inspect each of the sub-regions;

combining all location information to produce a distortion vector field for each of the sub-regions; and

using the distortion vector fields to make a pass/fail decision based on user-specified tolerances.

Claim 35 (original): An apparatus for inspecting a spatially distorted pattern, the apparatus comprising:

a memory for storing a digitized image of an object;

a region divider for dividing the digitized image of a region of interest into a plurality of sub-regions, as size of each of the sub-regions being small enough such that a conventional inspecting method can reliably inspect each of the sub-regions;

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a coarse alignment mechanism for approximately locating the pattern;

a search mechanism for locating each of the sub-regions sequentially in an order based on search tree information;

a vector field producer to combine all location information to produce a distortion vector field for each of the sub-regions; and

a comparing mechanism for using the distortion vector field to make a pass/fail decision based on user specified tolerances.

Claim 36 (original): A medium having stored therein machine-readable information, such that when the machine-readable information is read into a memory of a computer and executed, the machine-readable information causes the computer:

to run a coarse alignment tool to approximately locate a pattern;

to use information from a search tree and a root sub-region approximately located by the coarse alignment to locate a plurality of sub-regions sequentially in an order according to the information from the search tree, each of the sub-

regions being of a size small enough such that a convention inspecting method can reliably inspect each of the sub-regions;

to combine all location information to produce a distortion vector field for each of the sub-regions; and

to use the distortion vector fields to make a pass/fail decision based on user-specified tolerances.